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Re: Substitute pages

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SUBSTITUTE PAGES

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therefore an inappropriate handling of the photoconductor belt easily leads to a damaging of the same.

5 Methods for transport and for packaging of an endless belt are known from the printed documents US 3 888 577, US 5 708 924 A and US 4 811 839. In all of these methods, the packaged endless belt has at least approximately the shape that it also has in the installed state in a printer or copier. This leads to a large and consequently unwieldy and expensive packaging.

10 Further prior art is contained in the patent documents US 5,119,133 A, US 5,163,265 A, US 3,186,543 A, US 3,332,546 A and US 4,811,839 A.

The invention is based on the object to specify a method and suitable means for handling of an endless belt that make the handling of an endless belt easier and
15 prevent a damaging of the endless belt.

This object is achieved via a method according to claim 1. This object is also achieved via a unit according to claim 16 and a system according to claim 28.

20 A unit with a holder that comprises three cylindrical bodies, of which a first is inserted through the loop of an endless belt and a second is arranged outside of the loop and parallel to the first cylindrical body, is known from the printed documents DE 196 39 402 A1 and DE 28 35 167 A1. However, in these holders the endless belt is not wound around the first and the second cylindrical bodies. The known
25 holders are thus not suited to a space-saving packaging or, respectively, storage of endless belts.

Claims

1. Method for handling of an endless belt (12) for an electrophotographic printer or copier,
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in which the endless belt (12) is borne with the aid of a first, a second and a third cylindrical body (14, 16, 18),
whereby the first cylindrical body (14) is inserted through the loop (42) of
10 the endless belt (12),
the second cylindrical body (16) is arranged outside of the loop (42) of the endless belt (12) and parallel to the first cylindrical body (14), and
15 the endless belt (12) is wound around the first and the second cylindrical bodies (14, 16),
and in which the third cylindrical body (18) is inserted through the loop (42) at the free end of the endless belt (12) before or during the wrapping of
20 the first and the second cylindrical body (14, 16) with the endless belt (12).
in which the cylindrical bodies (14, 16, 18) with the wound endless belt (12) are housed in a container (10) for transport and/or for storage, and
25 in which the container (10) is arranged for extraction of the endless belt (12) such that the cylindrical bodies (14, 16, 18) lie horizontal, and the third cylindrical body (18) is raised from the container (10) into a horizontal position such that the endless belt (12) wound around the first and the second cylindrical bodies (14, 16) unwinds.
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2. Method according to claim 1, in which the endless belt (12) is wound around the first and the second cylindrical bodies (14, 16) so often that the third cylindrical body (18) rests on the wound unit formed from the first cylindrical body (14, the second cylindrical body (16) and the endless belt (12) wound around them.
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3. Method according to claim 1 or 2, in which at least one of the cylindrical bodies (14, 16, 18) protrudes at its ends over the width of the endless belt (12), and the ends of this at least one cylindrical body that are uncovered by the endless belt (12) are supported in supports (20) provided in the container (10).
- 10
4. Method according to claim 3, in which at least one of the supports 20 [sic] has a round support surface (28).
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5. Method according to claim 3 or 4, in which at least one of the supports (20) is formed by a frame in which are arranged the ends of the cylindrical bodies (14, 16, 18) uncovered by the endless belt (12).
- 20
6. Method according to claim 5, in which the frame (20) is dimensioned so narrow that the wound unit and the third cylindrical body (18) are held together.
- 25
7. Method according to claim 4 and any of the claims 5 and 6, in which the frame (20) is formed by a recess (22) in a carrier element (24) that has an essentially circular segment that forms the round support surface (28).
- 30
8. Method according to any of the claims 4 through 7, in which the wound unit unrolls on the round support surface (28) upon unwinding of the endless belt (12).

9. Method according to any of the claims 5 through 8, in which the third cylindrical body (18) is extracted from the frame (20) through an opening (30) in the frame (20).
- 5 10. Method according to claim 9, in which means (36) are provided with which the opening (30) can be sealed such that none of the cylindrical bodies (14, 16, 18) can leave the frame (20) via the opening (30).
- 10 11. Method according to claim 10, in which the means for sealing the opening (30) are formed by a web (36) that is shaped on a cover (32) of the container (10) and that, given a closed cover (32), protrudes into the opening (30).
- 15 12. Method according to claim 11, in which, upon closing of the cover (32), the web (36) is inserted between two of the cylindrical bodies (14, 16, 18) in the region of the ends uncovered by the endless belt (12).
- 20 13. Method according to any of the claims 3 through 12, in which the cylindrical bodies (14, 16, 18) are formed as tubes that are mounted on mounts (46, 48, 50) of the printer or copier after an extraction of the endless belt (12) from the container (10), and in which the endless belt (12) is slid across the tubes (14, 16, 18) into the printer or copier.
- 25 14. Method according to claim 13, in which the mounts (46, 48, 50) are arranged on the printer or copier such that, upon mounting of the tubes (14, 16, 18), the endless belt (12) looped around the tubes (14, 16, 18) assumes the shape that it has in the printer or copier.
- 30 15. Method according to claim 13 or 14, in which the third tube (18) is mounted on the uppermost mount (46) with the endless belt (12) suspended from it, which endless belt (12) is weighted down by the first tube (14)

lying in its loop (42); the first tube is mounted on the lowermost mount (46); and the second tube (16) is directed through the loop (42) of the endless belt (12) and is mounted on the middle mount (48).

5 16. Unit comprising an endless belt (12) and a holder,

in which the holder comprises a first, a second and a third cylindrical body (14, 16, 18) for bearing the endless belt (12),

10 whereby the first cylindrical body (14) is inserted through the loop (42) of the endless belt (12),

the second cylindrical body (16) is arranged outside of the loop (42) of the endless belt (12) and parallel to the first cylindrical body (14),

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and the endless belt (12) is wound around the first and the second cylindrical bodies (14, 16),

20 and whereby the third cylindrical body (18) is inserted through the loop (42) at the free end of the endless belt (12) wound around the first and the second cylindrical body (14, 16),

25 whereby the unit also comprises a container (10) in which the cylindrical bodies (14, 16, 18) are housed with the wound endless belt (12), whereby at least one of the cylindrical bodies (14, 16, 18) protrudes at its ends over the width of the endless belt (12), and the ends of this at least one cylindrical body (14, 16, 18) that are uncovered by the endless belt (12) rest on supports (20) provided in the container (10),

whereby at least one of the supports is formed by a frame (20) in which are arranged the ends of the cylindrical bodies (14, 16, 18) uncovered by the endless belt (12), and

5 whereby the frame (20) has an opening (30) through which the third cylindrical body (18) can be extracted from the frame (20).

17. Unit according to claim 16, in which the endless belt (12) is wound around the first and the second cylindrical bodies (14, 16) so often that the third
10 cylindrical body (18) rests on the wound unit formed from the first cylindrical body (14, the second cylindrical body (16) and the endless belt (12) wound around them.

18. Unit according to claim 16 or 17, in which at least one of the supports (20)
15 has a round support surface (28).

19. Unit according to any of the claims 16 through 18, in which the frame (20) is dimensioned such that it holds the wound unit and the third cylindrical
20 body (18) together.

20. Unit according to claim 18 and any of the claims 16, 17 and 19, in which the frame (20) is formed by a recess (22) in a carrier element (24) that has an essentially circular segment that forms the round support surface (28).

25 21. Unit according to claims 20, in which the opening (30) is formed in that the recess (22) in the carrier element (24) extends until the edge of the carrier element (24) at at least one point.

22. Unit according to any of the claims 16 through 21, in which means (36) are
30 provided with which the opening (30) can be sealed such that none of the

cylindrical bodies (14, 16, 18) can leave the frame (20) via the opening (30).

23. Unit according to claim 22, in which the means for sealing the opening (30)
5 are formed by a web (36) that is shaped on a cover (32) of the container (10) and that, given a closed cover (32), protrudes into the opening (30).
24. Unit according to claim 23 in which, given a closed cover (32), the web (36) protrudes between two of the cylindrical bodies (14, 16, 18) in the
10 region of the ends uncovered by the endless belt (12).
25. Unit according to any of the claims 16 through 24, in which the third cylindrical body (18) is optically identified.
- 15 26. Unit according to any of the claims 16 through 25, in which the cylindrical bodies are formed by cardboard tubes (14, 16, 18).
27. Unit according to any of the claims 16 through 26, in which the endless belt (12) is formed by a photoconductor belt for an electrophotographic printer
20 or copier.
28. System for electrophotographic printing or copying, comprising an electrophotographic printer or copier, an endless belt (12) that can be inserted into the printer or copier and a holder for the endless belt,
25 in which the endless belt (12) and the holder form a unit according to any of the claims 16 through 28 [sic],
- 30 in which the cylindrical bodies (14, 16, 18) of the holder are formed by tubes, and

in which the printer or copier has mounts (46, 48, 50) on which the tubes (14, 16, 18) can be mounted, whereby the mounts (46, 48, 50) are arranged such that, upon mounting of the tubes (14, 16, 18) on the mounts (46, 48, 50), the endless belt (12) looped around the tubes (14, 16, 18) assumes the shape that it has in the printer or copier.

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29. System according to claim 28, in which the mounts (46, 48, 50) are formed by mounting spikes.
- 10 30. System according to claim 28 or 29, in which the association of a tube (14, 16, 18) with a mount (46, 48, 50) is optically identified.